

THE GENUS ASTER IN NOVA SCOTIA

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THIS is a synopsis of the species of *Aster* known to occur in Nova Scotia, based chiefly on a study of collections in the Herbarium of Nova Scotia Agricultural College, the Herbarium of the University of Wisconsin, and the Gray Herbarium. Notes on distribution and habitat have been obtained from information given on specimen labels, supplemented by published records, and by field notes supplied by Mr. A. E. Roland, of Nova Scotia Agricultural College, Truro. No effort has been made to give full discussions of minor forms and hybrids, and of nomenclature, or to account for all published reports of species which are not included in the present list. Press of other work and of other circumstances have made it necessary to complete this study more hurriedly and less thoroughly than was desired, but it is hoped that it will prove helpful to those studying the flora of eastern Canada.

For much invaluable assistance and for many courtesies, I am indebted to Mr. Roland, and to Mr. C. A. Weatherby, of the Gray Herbarium. Grateful acknowledgment is made to the curators of the herbaria listed above for the use of collections in their charge.

In the following key and descriptions, the height of the involucre is given as measured from the base to the tips of the inner phyllaries; in *A. Rolandii*, *A. foliaceus*, and *A. puniceus*, the outer phyllaries may be longer.

KEY TO NOVA SCOTIA SPECIES OF ASTER

1. Middle and lower stem-leaves petioled, the blades abruptly narrowed or truncate or cordate at base
 2. Outermost phyllaries (involucral bracts) 1.0–2.5 mm. wide, less than $2\frac{1}{2}$ times as long as wide. 1. *A. macrophyllus*
 2. Outermost phyllaries 0.2–0.8 mm. wide, more than $2\frac{1}{2}$ times as long as wide
 3. Phyllaries glabrous on the back
 4. Involucres 5.2–8.2 mm. high; disks 4.5–7.5 mm. across; inflorescence corymbose-paniculate, the peduncles or ultimate branches very uneven in size. 3. *A. ciliolatus*
 4. Involucres 3.6–5.2 mm. high; disks 3–5 mm. across; inflorescence racemose-paniculate, the peduncles equal or grading uniformly in size. 4. *A. cordifolius*
 3. Phyllaries pubescent on the back. 5. *A. undulatus*

1. Middle and lower stem-leaves sessile, or tapering gradually to slender petiole-like bases
 5. Middle phyllaries with midveins expanded upward into prominent colored (usually green) tips
 6. Phyllaries glabrous on the back
 7. Involucres 3.3–6.0 mm. high; outer phyllaries 0.3–3.3 mm. long, not more than $\frac{2}{3}$ as long as the inner
 8. Rays 3.5–6.0 mm. long; leafy bracts of the peduncles and ultimate branches of the inflorescence oblong-lanceolate or narrowly oblong, acute or obtuse
 9. Leaves pubescent on the midvein beneath, at least toward the base. 6. *A. lateriflorus*
 9. Leaves glabrous beneath
 10. Involucres 4.8–6.0 mm. high; stems glabrous or more commonly pubescent; plants of Cape Breton Island. 7. *A. tenuipes*
 10. Involucres 3.3–5.0 mm. high; stems glabrous; plants of southwestern Nova Scotia. 8. *A. Tradescanti*
 8. Rays 5.5–10 mm. long; leafy bracts of the peduncles and ultimate branches of the inflorescence linear-lanceolate, acuminate. 9. *A. paniculatus*
 7. Involucres 5–12 mm. high; outer phyllaries 3–12 mm. or more long, more than $\frac{2}{3}$ as long as the inner
 11. Stems glabrous or pubescent above in lines
 12. Internodes just below the inflorescence 4–16 mm. long; plants 8–50 cm. tall; involucres 5–8 mm. high. 10. *A. Rolandii*
 12. Internodes just below the inflorescence 16–45 mm. long; plants 30–110 cm. tall; involucres 6–9 mm. high. 11. *A. foliaceus*
 11. Stems hispid-pubescent over the surface. 12. *A. puniceus*
 6. Phyllaries glandular or pubescent or both on the back
 13. Involucres less than 6 mm. high. 5. *A. undulatus*
 13. Involucres more than 6 mm. high. 13. *A. novae-angliae*
5. Middle phyllaries without colored tips, or with colored tips not formed by the expansion of the midveins
 14. Involucres more than 6 mm. high
 15. Outer phyllaries 1.0–2.5 mm. wide. 2. *A. radula*
 15. Outer phyllaries 0.2–0.8 mm. wide
 16. Largest stem-leaves 3–12 mm. wide; plants with 41–75 or more leaves below the inflorescence. 14. *A. nemoralis*
 16. Largest stem-leaves 9–50 mm. wide; plants with 10–40 leaves below the inflorescence
 17. Largest stem-leaves 9–24 mm. wide; plants with 25–40 leaves below the inflorescence. × *A. Blakei*
 17. Largest stem-leaves 20–50 mm. wide; plants with 10–20 leaves below the inflorescence. 15. *A. acuminatus*
 14. Involucres less than 6 mm. high. 16. *A. umbellatus*

I. MACROPHYLLUS SERIES

Involucres large (6.5–12 mm. high); phyllaries broad, obtuse or acute, with colored tips not formed by the expansion of midveins.

1. *A. MACROPHYLLUS* L. (Including var. *velutinus* Burgess.)
Woods and thickets, less commonly in open ground; frequent,

chiefly in the central and western parts of the province, from Pictou Co. to Yarmouth Co.

2. *A. RADULA* Ait. (Including var. *strictus* (Pursh) Gray, at least as to plants of Nova Scotia.) Bogs, wet meadows, and damp thickets; common throughout the province.

II. CORDIFOLIUS SERIES

Involucres small or middle-sized (3.6–8.2 mm. high); phyllaries narrow, acute, with colored tips formed by the expansion of the midveins. Middle and lower stem-leaves petioled, the blades truncate or cordate at base.

3. *A. CILIOLATUS* Lindl. ex Hook., Fl. Bor.-Am. 2: 9, 1834. *A. Lindleyanus* T. & G., Fl. N. A. 2: 122, 1841. *A. Lindleyanus* var. *ciliolatus* A. Gray, Syn. Fl. N. A. 1: 182, 1884.

Known from a single collection, the specimen not yet in flower but unmistakably this species: border of old hillside woods, Mt. Uniacke, Hants Co., Fernald, Bartram & Long, July 26, 1921 (in Gray Herbarium).

4. *A. CORDIFOLIUS* L. Thickets, roadsides, and open ground; common in the central and northern parts of the province, from Annapolis Co. to Cape Breton Island.

5. *A. UNDULATUS* L. Dry open woods and thickets; southern Lunenburg Co., and (according to Weatherby, 1942) at Greenfield in adjacent Queens Co.

III. LATERIFLORUS SERIES

Involucres small (3.3–6.0 mm. high); phyllaries narrow, obtuse or acute, with colored tips formed by the expansion of the midveins. Leaves sessile, linear-lanceolate to elliptic. Peduncles and branches bearing numerous leafy bracts of more or less uniform size.

6. *A. LATERIFLORUS* (L.) Britton. Dry open woods, thickets, fields, pastures, and roadsides; very common throughout the province.

7. *A. tenuipes* (Wieg.), stat. nov. *A. lateriflorus* var. *tenuipes* Wiegand, RHODORA 30: 174, 1928.

Swamps and damp woods, Cape Breton Island.

With more diffuse inflorescence and fewer longer-peduncled heads than *A. lateriflorus*, and without the pubescent midveins of the leaves of that species, which it otherwise resembles in having the stem usually pubescent and the disk corollas deeply lobed. In general appearance much like *A. Tradescanti*. It seems desirable to indicate its peculiarities by according it recognition as a separate species, rather than retaining it as a variety under *A. lateriflorus*, where it is not at home.

8. *A. TRADESCANTI* L.; Fernald, *RHODORA* **35**: 312–314, 1935. *A. saxatilis* (Fernald) Blanchard; Wiegand, *RHODORA* **35**: 34, 1933.

Damp shores in the southern part of the province, in Digby, Yarmouth, and Queens Counties.

IV. PANICULATUS SERIES

Involucres rather small (4.0–5.5 mm. high); phyllaries narrow, acute, with green tips formed by the expansion of the midveins. Leaves sessile, narrowly lanceolate. Peduncles and branches bearing few scattered leafy bracts of uneven size.

9. *A. PANICULATUS* Lam., *Encyc.* **1**: 306, 1783; *sensu* Wiegand, *RHODORA* **35**: 28–29, 1933. Not *A. paniculatus* Mill., *Gard. Dict.*, no. 24, 1768.

Damp thickets and marshy ground, Cape Breton Island; apparently not common.

The name *A. paniculatus* Lam., though illegitimate, is here retained as a temporary expedient, following the nomenclature used by Wiegand, pending a more complete investigation of the much involved and uncertain synonymy of the species.

V. FOLIACEUS SERIES

Involucres middle-sized to large (5–9 mm. high); middle phyllaries with green tips formed by the expansion of the midveins, outer phyllaries loose, more or less enlarged and foliaceous. Leaves glabrous, sessile, often very slightly clasping at base. Stems glabrous or pubescent in lines.

10. *A. Rolandii*, sp. nov. Species parva maritima littoralis, *A. foliaceo* affinis, sub nomine *A. novi-belgii* confusa: minor, caulis 8–50 cm. altus, internodi superiores 4–16 mm. longi; inflorescentia corymboso-paniculata; involucra 5–8 mm. alta, phyllariis exterioribus plus minusve foliaceis, longioribusque interioribus; ligulae 8–13 mm. longae, disci 8–12 mm. lati, pappus plus minusve tinctus. TYPE: Roadsides, Troy, Inverness Co., Nova Scotia, *A. R. Prince and C. E. Atwood 1456*, Sept. 26, 1928 (in *Herb. Univ. of Wisconsin*).

Perennial from extensively creeping and freely branching rootstocks, forming loose mats. Stems glabrous or pubescent in lines above, more or less striate or sulcate, varying in color from stramineous or light green through speckled to solid red-brown or red-purple. Branching normally above the middle, the inflorescence broad and more or less flat-topped. Leaves glabrous except for the scabrous margins, elliptic-lanceolate to linear-lanceolate, entire or sharply and shallowly serrate, dark green above, paler and prominently reticulate-veined beneath, 1-ribbed, often with

sterile axillary shoots. Branches and peduncles with scattered leafy bracts of uneven size, the upper much reduced. Involucres broadly turbinate or hemispherical, the outer phyllaries from slightly shorter to longer than the inner, loose or occasionally almost squarrose, acute, more or less foliaceous. Pappus gray or dingy yellow to light brown or rust-color.

Very common on sandy or gravelly beaches and in wet places along the coast, throughout Nova Scotia, including Sable Island. Found also along the coasts of Quebec, New Brunswick, and Prince Edward Island.

True *Aster novi-belgii* L., based on "*Aster novae belgiae latifolius, umbellatus, floribus dilute violaceis*" of Hermann's *Hortus Lugduno-Batavus*, and typified by plate 69 in that work (cf. Gray, 1882), is a much stouter plant than *A. Rolandii*, with the long internodes and tall stems of *A. foliaceus*, but the inflorescence racemose-paniculate, and the branches and peduncles with numerous rather uniform leafy bracts. The inflorescence is usually very large, often embracing more than half the plant. Judging from the rather scanty herbarium material seen, it ranges from Massachusetts to Pennsylvania and Virginia, probably in several varieties differing in leaf proportions, leaf texture, nature of the phyllaries and bracts of the peduncles (prevaillingly strongly squarrose), and size of involucres. Some of the varieties recognized by Asa Gray (1884) were based on European garden plants of questionable identity, and perhaps should not be retained for the wild forms of North America. The application of all the names is in need of revision.

11. *A. FOLIACEUS* Lindl. *A. junceus* and *A. longifolius* of authors, in large part, especially as to plants of Nova Scotia.

Swamps and marshes, both along the coast and in the interior, common throughout the province.

Variable in leaf-proportions, number of heads, compactness of inflorescence, leafiness of phyllaries, and time of flowering. In some Quebec specimens the outer phyllaries are extremely large and leafy, suggesting the western *A. Cusickii*; these perhaps should receive recognition as a separate variety. Certain others with broad-based and more or less clasping leaves may represent hybrids with *A. puniceus*, and some with very narrow leaves suggest hybridization with *A. junciformis* Rydb., a species now known to extend eastward to Quebec (Anticosti) and New Brunswick. The whole group of *Aster foliaceus* is a complex one, whose

proper revision for eastern North America would entail a study of the numerous and difficult western forms of the species and its relatives. No attempt is made here to do more than assign the Nova Scotia plants to the proper species, without concern for varieties which it may be desirable to recognize at some later time.

As indicated in a previous paper (1941), *Aster junceus* Ait. was based on a mixture, and the name has been applied to a mixture containing one element which was not among those known to Aiton. No more satisfactory solution has resulted from the present study, and the name is therefore dropped altogether. *Aster longifolius* Lam. may be the same as *A. foliaceus* Lindl. Several specimens so named by Gray, after seeing the type, are *A. foliaceus*, but one is *A. paniculatus*. The description is insufficient for satisfactory identification. In view of the ever present possibility of hybridization, especially common in this group, it does not seem desirable to displace the well established *A. foliaceus* Lindl., a name fortunately based on wild plants collected in America.

VI. PUNICEUS SERIES

Involucres large (6–12 mm. high); middle phyllaries with green tips formed by the expansion of the midveins, outer phyllaries enlarged and foliaceous. Leaves scabrous, sessile and auriculate-clasping. Stems hispid-pubescent over the surface.

12. *A. PUNICEUS* L. Swamps and wet open places; common throughout the province.

Some of the named varieties are probably to be referred to hybrids with *A. foliaceus* or other species, others are hardly more than forms of the species itself. For the present, no attempt is made to dispose of them individually.

VII. NOVAE-ANGLIAE SERIES

Involucres large (7–12 mm. high), glandular; rays very numerous. Leaves auriculate-clasping, rather short and crowded. Stems hispid-pubescent.

13. *A. NOVAE-ANGLIAE* L. Vicinity of Annapolis, Annapolis Co., and Woodburn, Pictou Co.; probably an escape from cultivation.

VIII. NEMORALIS SERIES

Involucres rather large (6.3–9.0 mm.); midveins of the phyllaries not expanded upward. Rays long and conspicuous.

14. *A. NEMORALIS* Ait. Bogs and marshes, very common throughout the province.

× *A. BLAKEI* (Porter) House, N. Y. State Museum Bull. **219-220**: 241, 1919. *A. nemoralis* var. *Blakei* Porter, Bull. Torr. Bot. Club **21**: 311, July 20, 1894. *A. nemoralis* var. *major* Peck, N. Y. State Mus. Ann. Rept. **47** (1893): 155, 1894; not *Aster major* (Hook.) Porter (as *majus*), Mem. Torr. Bot. Club **5**: 325, 1894. (*A. acuminatus* × *A. nemoralis*.)

Borders of woods and thickets, in damp or rather dry ground; rather common in the southern and eastern parts of the province.

In Nova Scotia, *Aster Blakei* is most common in sections where one supposed parent, *A. acuminatus*, is rare or unknown. This does not necessarily rule out the possibility of hybridization in the past as an explanation for the origin of *A. Blakei*, but does indicate the desirability of further investigation. It is unusually common and uniform for a hybrid *Aster*, but the parents belong to a group separate from the common eastern *Asters*, and it is to be expected that hybrids between them might behave differently from those of the true *Asters*. In view of the intermediate characters of *A. Blakei*, both morphological and ecological, House's conclusion that it is a hybrid seems entirely reasonable. In general appearance it resembles *A. nemoralis* more than *A. acuminatus*, but as shown in the key, it is about as close to one as to the other in the two most useful diagnostic characters.

15. *A. ACUMINATUS* Michx. Deciduous woodlands and thickets, preferring drier soils; common in the northwestern part of the province, very uncommon elsewhere.

X. UMBELLATUS SERIES

Involucres small (3.0–4.6 mm. high); midveins of the phyllaries not expanded upward. Inflorescence flat-topped.

16. *A. UMBELLATUS* Mill. Swamps, damp thickets, and marshy ground; common throughout the province.

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A NEW SPECIES OF HAPLOPAPPUS FROM SOUTHWESTERN TEXAS

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LAST August the author made a collecting trip¹ through that interesting desert and desert-transition area, the Transpecos Region of Southwestern Texas. At the first station, selected a few miles northeast of Carlsbad because the vegetation was rapidly changing from the familiar plains type to the very different Transpecosian flora, an odd-looking Composite was noticed, but collected only in unicate. It was not taken again until ten days later near Van Horn in Culberson County, Texas. Upon later examination it proved to be a species of *Haplopappus* which did not fit available descriptions. Its stiffly erect habit, numerous small leaves, very leafy branches terminated by single heads, and rays turning reddish upon drying tend to set it apart from the known species of that genus. In examining Hall's monograph² it became evident that it belongs in the *H. phyllocephalus* complex.

Dr. Johnston, who determined or verified duplicates of this collection, in kindly checking *Haplopappi* in the Gray Herbarium found another sheet of this species. It is Dr. Havard's number 88 taken at "Guadalupe Mts., W. Texas". Dr. Johnston writes, "Gray was troubled in identifying it (a good specimen) and finally wrote on the sheet, 'Hybrid of *A. rubiginosus* and *Aster gymnocephalus*'." I believe, however, that it is a distinct

¹ Funds to defray the expenses of this investigation were furnished by the Carnegie Institution through the kind offices of Dr. Forrest Shreve of the division of Desert Investigations of the Carnegie Institution. Tucson, Arizona.

² Hall, H. M., *The Genus Haplopappus. A Phylogenetic Study in the Compositae.* Carnegie Inst. of Washington, Pub. 398. 1928.